

**EXPERIMENTAL DESIGN FOR COMPLEX SYSTEMS**

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**ABSTRACT**

5        A method for a systematic approach to forming experimental designs for large, complex systems after an idea for a product is formed. Critical variables for the product are determined by experts in the field, a design matrix  $U_k$  is defined, a base design matrix  $X$  is generated,  $Y(P) = (I - B(B^T B)^{-1} B^T)[(X P) // U]A$  & Wynn's criterion is defined, where  $P$  is a permutation matrix,  $I$  is an identity matrix,  $B$  is a blocking matrix,  $B^T$  is a transposed matrix of  $B$  and  $A$  is a matrix composed of causal map-based coefficients and wherein a design matrix  $U_k$  is created. The index  $k \leftarrow k + 1$  is set and an algorithm to choose the best of random column permutation matrices  $P$  and an algorithm to choose the best column permutation matrix  $P$  that is near a previous solution and setting  $U_k \leftarrow [XP^k$  with rows from  $U_{k-1}$  appended].

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